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09/118,945	07/17/1998	JAMES T. HURLEY	042390.P4661	9535

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10/25/2002

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EXAMINER

GOOD JOHNSON, MOTILEWA

ART UNIT

PAPER NUMBER

2672

DATE MAILED: 10/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/118,945

Applicant(s)

HURLEY ET AL.

Examiner

Motilewa A. Good-Johnson

Art Unit

2672

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. This action is responsive to communications: application, filed on 07/17/1998; IDS paper #3, filed on 07/17/1998; IDS, paper #8, filed on 11/13/2000; Amendment A, filed on 11/13/2000; Preliminary Amendment B, filed on 07/23/2001; Response, filed on 04/29/2002.

**This action is made final.**

2. Claims 1-20 are pending in the case. Claims 1, 7, 12 and 15 are independent claims. Claims 1-4, 6, 7 and 12-15 have been amended. Claims 18-20 have been added.

3. The present title of the application is "Extension of Fast Phong Shading Technique for Bump Mapping" (as originally filed).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aleksic et al., U.S. Patent Number 6,175,368, "Method and Apparatus for Object Rendering Including Bump Mapping", class 345/430, 01/16/2001, filed on 03/24/1998.

As per independent claim 1, . . . **a method for implementing bump mapping, comprising the steps of: generating a table of color values . . . ; Aleksic et al. discloses in col. 3, lines 11-14; determining first and second vertex angle coordinates for a vertex vector; Aleksic et al. discloses in col. 3, lines 61-67 - col. 4, lines 1-14; interpolating the first and second vertex angle coordinates to provide first and second angle coordinates for each pixel . . . ; Aleksic et al. discloses in col. 4, lines 15-21; modifying the estimated angle coordinates, using a perturbation source; Aleksic et al. discloses in col. 3, lines 62-65; converting the modified angle coordinates . . . ; Aleksic et al. discloses in col. 4, lines 22-30; and assigning the pixel a color value according to the one or more color variables.** Aleksic et al. discloses in col. 53-58, lines 28-30.

However, it is noted that Aleksic fails to disclose interpolating angle coordinates. Aleksic discloses in col. 3, lines 51-61, the object parameters, which include the physical coordinates and color data at the vertexes of the objects and or blending information. It would have been obvious to one of ordinary skill in the art at the time of the invention that Aleksic allows for object parameters including physical coordinates and thus inherently allowing for said angle coordinates to be given as a physical coordinates. Aleksic further discloses blending of vector information and thus inherently suggesting interpolation of color information.

With respect to dependent claim 2, . . . **generating angle perturbations; and combining the angle perturbations with the angle coordinates.** Aleksic et al. discloses in col. 3, lines 62-65.

With respect to dependent claim 3, . . . **estimating bump coordinates for the pixel; and converting the bump coordinates to angle perturbations.** Aleksic et al. discloses in col. 3, lines 62-65.

With respect to dependent claim 4, . . . **converting the bump coordinates comprises retrieving angle perturbations from a bump map location . . .** Aleksic et al. discloses in col. 4, lines 22-54.

With respect to dependent claim 5, . . . **determining angle coordinates for normal vector orientations at vertices . . . ; interpolating angle coordinates for the pixel from the determined angle coordinates.** Aleksic et al. discloses in col. 4, lines 15-21.

With respect to dependent claim 6, . . . **determining bump coordinates for the vertices of the polygon; interpolating bump coordinates for the pixel from the determined vertex bump coordinates.** Aleksic et al. discloses in col. 4, lines 55-67.

As per independent claim 7, . . . **a graphics system comprising: a geometry engine . . . ; a color map including color values for a sample of vector orientations . . . ;** Aleksic et al. discloses in col. 4, lines 55-59; **a perturbation source to provide orientation perturbations;** Aleksic et al. discloses in col. 3, lines 62-65; **and a rendering engine to convert vertex vector and a perturbation to a pair of vertex**

**perturbation values . . . and assign a color value to each pixel . . .** Aleksic et al. discloses in col. 4, lines 22-30.

However, it is noted that Aleksic fails to disclose angle coordinates. Aleksic discloses in col. 3, lines 51-61, the object parameters, which include the physical coordinates and color data at the vertexes of the objects and or blending information. It would have been obvious to one of ordinary skill in the art at the time of the invention that Aleksic allows for object parameters including physical coordinates and thus inherently allowing for said angle coordinates to be given as a physical coordinate. Aleksic further discloses generating color information for each pixel of the object from the received object parameters.

With respect to dependent claim 8, . . . **the orientation-dependent color variables are linearly related to angle coordinates . . .** Aleksic et al. discloses in col. 3, lines 11-20.

With respect to dependent claim 9, . . . **the perturbation source is a bump map including angle perturbations . . .** Aleksic et al. discloses in col. 5, lines 49-60.

With respect to dependent claim 10, . . . **rendering engine includes a generator that combines the angle coordinates and angle perturbations into perturbed color coordinates.** Aleksic et al. discloses in col. 4, lines 22-35.

With respect to dependent claim 11, . . . **the perturbation source is an algorithm for associating perturbations with polygon locations . . .** Aleksic et al. discloses in col. 5, lines 12-24 and in lines 45-48.

As per independent claim 12, it is rejected based upon similar rational as above independent claim 1.

With respect to dependent claim 13, . . . **generating first and second angle perturbations for the pixel; and combining the first and second angle perturbations with the first and second angle coordinates to form modified first and second angle coordinates.** Aleksic et al. discloses in col. 1, lines 63-67.

With respect to dependent claim 14, . . . **interpolating the first and second angle coordinates for the pixel from the angle coordinates associated with the vertex vector; and converting the interpolated first and second angle coordinates to scaled angle coordinates.** Aleksic et al. discloses in col. 5, lines 25-35.

As per independent claim 15, it is rejected based upon similar rational as above independent claim 7.

With respect to dependent claims 16 and 17 respectively, see above rejection for dependent claims 9 and 10.

As per independent claim 18, it is rejected based upon similar rational as above independent claim 1.

With respect to dependent claim 19, . . . **each color value is associated with first and second angle coordinates . . .** Aleksic discloses in col. 4, lines 1-14.

With respect to dependent claim 20, . . . **graphics pipeline includes texture-mapping hardware and the color values are accessed using the texture mapping hardware.** Aleksic discloses in col. 4, lines 57-59.

***Response to Arguments***

6. Applicant's arguments filed 06/24/2002 have been fully considered but they are not persuasive.

Applicant argues that it would have been obvious to give angle coordinates as physical coordinates and interpolate color information. It is well known in the art that in interpolating the data one could access other parameter data from the interpolated data, thus providing obviousness to interpolate parameters of data or coordinates of the object.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Motilewa A. Good-Johnson whose telephone number is (703) 305-3939. The examiner can normally be reached on Monday - Friday 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

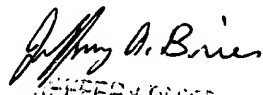


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Motilewa A. Good-Johnson  
Examiner  
Art Unit 2672

mgj  
October 18, 2002

  
JEFFERY BRIER  
PRIMARY EXAMINER